

ORDER

6600.27

PROJECT IMPLEMENTATION PLAN

INTEGRATED COMMUNICATIONS SWITCHING SYSTEM (ICSS)

PHASE 1B (Stage 2)



March 27, 1992

**DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION**

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FOREWORD

This order transmits the Project Implementation Plan (PIP) for the Integrated Communications Switching System (ICSS) Phase 1B Stage 2 project and provides technical guidance and management direction for the orderly implementation of the ICSS Phase 1B Stage 2. This order also establishes implementation procedures and defines responsibilities governing the required activities to ensure that the ICSS Phase 1B Stage 2 is properly introduced into the National Airspace System (NAS). This order is prepared in accordance with FAA-STD-036, Preparation of Project Implementation Plans.


Joann Kansier

Program Manager for Voice Switching and Recording



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CHAPTER 1. GENERAL

1. **PURPOSE.** This order sets forth FAA technical guidance and management direction for implementing the ICSS Phase 1B Stage 2. It is to be used for all technical and resource planning activities concerned with ICSS Phase 1B Stage 2 implementation.

2. **DISTRIBUTION.** This order is distributed to branch level in the office of the Program Directors for Communications and Aircraft Acquisition, Weather and Flight Service Systems and the Acquisition Support and Systems Maintenance Service; to division level in the Air Traffic Plans and Requirements Services; Offices of Budget, Chief Counsel, and Training and Higher Education; to director level in the Offices of the Associate Administrators for Air Traffic and Airway Facilities; to branch level in the regional Airway Facilities, Air Traffic and Logistics divisions; to director level at the FAA Technical Center and Mike Monroney Aeronautical Center; limited distribution to the Airway Facilities sectors, sector field offices, sector field units and sector office units; and to the Automated Flight Service Stations having ICSS.

3. **DEFINITIONS.** The definition of acronyms used in this order may be found in appendix 1.

4. **AUTHORITY TO CHANGE THIS ORDER.** The Program Manager for Voice Switching and Recording, ANC-200, may issue changes to this order necessary to manage and implement the ICSS Phase 1B Stage 2 project which do not affect policy, delegation of authority, or an assignment of responsibility.

5. **SCOPE.** This order is restricted to all aspects of the full and open competitive procurement ICSS Phase 1B Stage 2 implementation, beginning with site surveys and site preparation and ending with equipment maintenance, training, and configuration management (CM). This order does not include the regional GSA purchase of voice switching equipment which is referred to as ICSS Phase 1B Stage 1. Therefore, all references to ICSS Phase 1B hereafter in this order pertain to ICSS Phase 1B Stage 2.

6.-19. **RESERVED.**



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CHAPTER 2. PROJECT OVERVIEW

20. **SYNOPSIS.** The ICSS Phase 1B program office will procure additional quantities of non-developmental voice equipment to satisfy requirements for voice switches for large Airport Traffic Control Towers (ATCT) and Terminal Radar Approach Control (TRACON) facilities. The ICSS Phase 1B will provide reliable voiceband switching equipment and related communications capabilities to ATCT and TRACON personnel including ground-to-ground (G/G) and air-to-ground (A/G) communications.

21. **PURPOSE.** The ICSS Phase 1B project will provide the hardware and software needed to accomplish the objectives listed in paragraph 20.

22. **HISTORY.**

a. In the years preceding 1980, electromechanical voice switching systems were leased from regulated common carriers. It was during this time period that the FAA began to realize that many existing voice switching systems were becoming technologically obsolete, unmaintainable and could no longer satisfy operational requirements in the NAS.

b. In 1981, the Defense Commercial Communications Office (DECCO) acting for the FAA, issued a solicitation for a competitive lease with option to buy for 208 ICSS's for ATCT's, TRACON's, and Automated Flight Service Stations (AFSS). The ICSS Phase 1 contract was awarded to Denro Incorporated for 132 Type 1 (for small ATCT's and TRACON's) and 14 Type 3 (for AFSS's) ICSS systems, and to Litton Amecom for 31 Type 2 (for large ATCT's and TRACON's) and 31 Type 3 ICSS's. Delivery to the FAA of ICSS's under the Phase 1 procurement was completed in 1989. Only Type 3 ICSS's are listed in the Capital Investment Plan (CIP). In December 1988, the ICSS Phase 1A contract was awarded to Denro for 14 additional Type 3 ICSS systems for AFSS's.

c. There currently exist approximately 170 ATCT's and 100 TRACON's which are still served by leased electromechanical switching systems. These electromechanical switching systems were provided to the FAA by a variety of vendors. The fact that these systems are obsolete and unmaintainable necessitates the procurement of additional modern voice switches.

d. Furthermore, the FAA periodically modernizes or relocates existing ATCT and TRACON facilities or builds new facilities. New requirements have also arisen from the Interim Support Plan (ISP) for the installation of voice switches to support airport surveillance radars. New voice switches are also needed to meet these requirements.

e. On January 30, 1990, in response to the increased demand for voice switches, the Associate Administrator for Airway Facilities, AAF-1, included the ICSS Phase 1B program on the Transportation Systems Acquisition Review Council (TSARC) Project List (TPL). Then on April 24, 1990, DECCO acting as the contracting agency, issued a solicitation for a competitive purchase of ICSS Phase 1B equipment.

f. During 1990, the FAA conducted a study of terminal voice switching requirements. In March 1991, the Executive Director for Acquisition approved a revised terminal voice switch program which would include an expanded ICSS Phase 1B procurement for larger ATCT's and TRACON's, and a small switch procurement to support Visual Flight Rules (VFR) ATCT's with four or fewer positions. An acquisition plan for this revised program was approved in August 1991.

23.-29. RESERVED.

CHAPTER 3. PROJECT DESCRIPTION

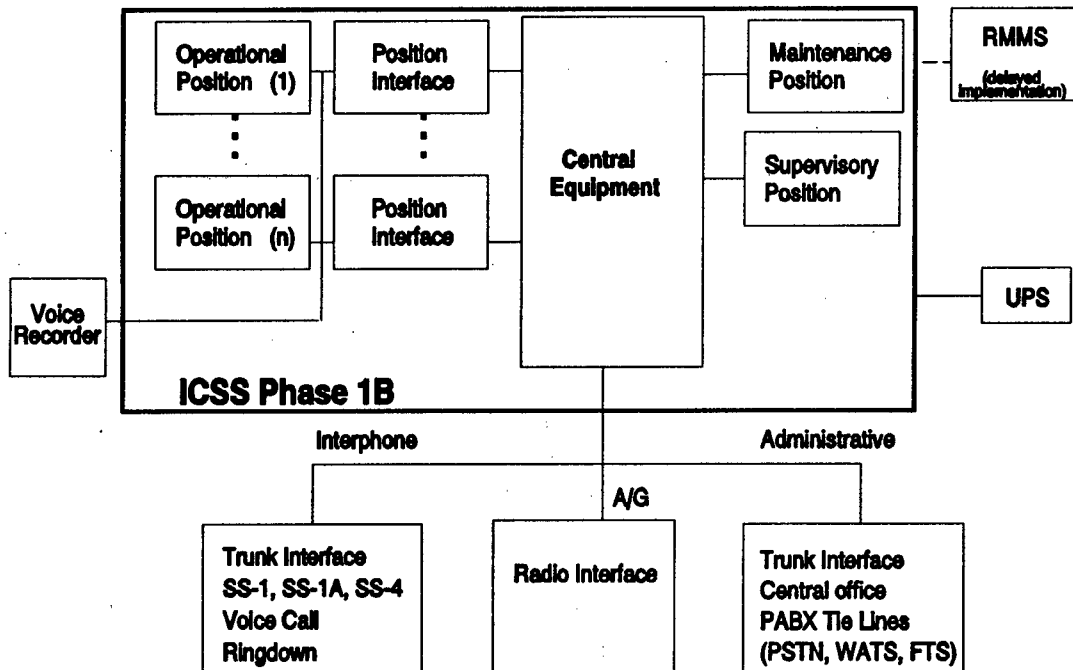
30. **FUNCTIONAL DESCRIPTION.** The connectivity of the ICSS Phase 1B is depicted in figure 3-1. The general functional capabilities of ICSS Phase 1B are discussed in the following subparagraphs. Detailed functional and technical requirements may be found in FAA-P-2854a, ICSS Phase 1B Purchase Description.

a. **Operational Features.** The ICSS Phase 1B will provide direct and indirect access intercom communications, with or without override, within a facility. Direct and indirect access interphone with or without override, for communications to Air Route Traffic Control Centers (ARTCC), ATCT's, TRACON's, AFSS and other remote FAA and non-FAA locations will also be provided. The ICSS Phase 1B also interfaces to existing radio equipment.

b. **Supervisory Features.** The ICSS Phase 1B will provide software controlled reconfiguration capabilities for changing interphone, intercom, and radio frequency connectivity within a facility. Computer-based reconfiguration for single positions or entire facilities will be available through the use of one or more designated interactive terminals.

c. **Maintenance Features.** ICSS Phase 1B systems include automated diagnostic equipment that provide real time monitoring of critical components within the system. Aural and visual alarms will be provided at a maintenance position and at designated operational positions to alert personnel of failures. A diagnostic display terminal will identify the defective component to the Line Replaceable Unit (LRU) level. The ICSS Phase 1B will also interface to the Remote Maintenance Monitoring System (RMMS) although the implementation of this interface will be delayed. For a description of this interface and an explanation of the delay, see paragraph 33f.

31. **PHYSICAL DESCRIPTION.** ICSS Phase 1B systems will be modular and will be installed fully wired for the maximum number of positions within a size group. Figure 3-2 details the various size groups for the ICSS Phase 1B. Within a size group, the addition of positions and other interfaces will generally involve the addition of circuit cards and position equipment. All ICSS Phase 1B systems will be installed with a maintenance position. This maintenance position is not included in the sizes indicated in figure 3-2.

FIGURE 3-1. ICSS PHASE 1B FUNCTIONAL DESCRIPTION**FIGURE 3-2. ICSS PHASE 1B SIZING**

BASIC SYSTEM	OPERATIONAL POSITIONS
BS-1	4 - 7
BS-2	8 - 15
BS-3	16 - 23
BS-4	24 - 80@

@ - If 10 split positions are used, the maximum number of operational positions will be 70.

a. **Cabinet and Frame Construction.** Figure 3-3 provides the maximum cabinet sizes for the basic systems. These sizes do not include demarcation blocks, frames, or aisle space.

b. **Air Traffic Control Position Equipment.** Operational position equipment

FIGURE 3-3. ICSS PHASE 1B MAXIMUM CABINET AND FRAME SIZES

BASIC SYSTEM	HEIGHT (inches)	WIDTH (inches)	DEPTH (inches)
BS-1	90	100	30
BS-2	90	100	30
BS-3	90	200	30
BS-4 (up to 40 positions)	90	200	30
BS-4 (41 to 60 positions)	90	300	30

which will interface to G/G and A/G communication equipment will be provided. Each operational position will be equipped with two headset jacks, and a maximum of 50 direct access selectors and 48 radio frequency selectors. Each position will also be equipped with a Dual Tone Multi-Frequency (DTMF) keypad for indirect access signaling. Split operational positions will provide the capability of separating A/G and G/G communications. Two sets of two headset jacks will be provided for the A/G and the G/G operations. The physical characteristics of position equipment will comply with FAA-E-2312a, Console, TRACON/RAPCON Modular.

c. **Configuration Control Equipment.** An interactive configuration control terminal and display will be provided to initiate position and system reconfiguration. Reconfiguration will provide for changes in connectivity of G/G lines and radio frequencies on a position basis or throughout the facility. A complete list of the capabilities provided through system reconfiguration can be found in FAA-P-2854a, ICSS Phase 1B Purchase Description, paragraph 2.4.1.

d. **Power System Equipment.** An Uninterruptible Power Supply (UPS) meeting the requirements of FAA-G-2100e, Electronic Equipment General Requirement, will be provided if needed to ensure power to the ICSS Phase 1B equipment. The UPS will provide sufficient power to support critical equipment operations for 15 minutes, under full load conditions, within 100 milliseconds (ms) of the loss of primary or backup power to the UPS. If the site receiving the ICSS Phase 1B already has a fully functional UPS, meeting the requirements of FAA-P-2854a, then a UPS will not need to be ordered.

32. **SYSTEM REQUIREMENTS.** ICSS Phase 1B architectural, mechanical, and electrical requirements are defined in the following subparagraphs.

a. **Space.** Sufficient space must be provided for the ICSS Phase 1B demarcation frame, the ICSS Phase 1B frame, and for maintenance access to the front and rear of all frames and cabinets. Maintenance access to the front and back of all frames and cabinets must be a minimum of 48 inches.

b. **Cooling Requirements.** ICSS Phase 1B uses conduction, radiation and free convection cooling using room air. Integrated fans may be used to enhance the cooling process. The ICSS Phase 1B is designed to operate in the following environment:

(1) Ambient temperatures ranging from 40 to 100 degrees Fahrenheit (F).

(2) 10 percent to 80 percent noncondensing relative humidity.

(3) Altitudes ranging up to 10,000 feet.

(4) Maximum temperature gradient of 15 degrees F per hour.

c. **Electrical.** ICSS Phase 1B equipment requires nominal single phase 120 Volts Alternating Current (VAC) ± 10 percent, 60 Hertz (hz) ± 10 percent power. Power for the central equipment will be provided to the ICSS Phase 1B through the UPS (see paragraph 31d). Transient protection, grounding, bonding, and shielding requirements will be in accordance with FAA-STD-020a, Transient Protection, Grounding, Bonding and Shielding Requirements for Equipment. Transient protection, grounding, bonding, and shielding requirements for the facility will be in accordance with FAA-STD-019a, Lighting Protection, Grounding, Bonding and Shielding Requirements for Facilities.

33. **INTERFACES.** The following subparagraphs provide an overview of the ICSS Phase 1B interfaces.

a. **Multi-access Lines.** The ICSS Phase 1B will be equipped with interfaces to Selective Signaling (SS)-1, SS-1A, and SS-4 lines. Mixed SS dial and voice call interfaces will also be provided. Signaling protocols will conform to those in use in the NAS environment. The ICSS Phase 1B will interface with multi-access lines in accordance with NAS-IC-42028403, TCS and ICSS to Existing ICSS Trunks.

b. **Nonselective Lines.** ICSS Phase 1B will be equipped with an interface to automatic and manual ringdown lines and an interface to voice call lines. ICSS Phase 1B will provide 20 or 30 Hz ringing frequencies. The ICSS Phase 1B will interface with nonselective lines in accordance with NAS-IC-42028403. A determination will be required by the facility regarding the provision of a ringing supply for incoming ringdown circuits. It is essential that a determination be made with the serving carrier as to the requirements for a ringing supply for ICSS 1B on existing ringdown lines.

c. **Existing Radio Equipment.** ICSS Phase 1B will be equipped with an interface for existing radio equipment. This interface will support Voice Frequency Signaling System (VFSS), Grim tone control equipment and local radio equipment and Radio Control Equipment (RCE). The interface with RCE will only provide the ICSS 1B functions available with VFSS or GRIM type equipment. The ICSS Phase 1B will interface with existing radios equipment in accordance with NAS-IC-42028401.

d. **Private Automatic Branch Exchange (PABX) and Central Office (CO) Equipment.** ICSS Phase 1B will be equipped with a four-wire Ear and Mouth (E&M) signaling interface for use with PABX equipment. CO trunks for local calling, Federal Telephone System (FTS) or Wide Area Telephone System (WATS) may be two or four-wire interfaces. The ICSS Phase 1B will interface with PABX and CO equipment in accordance with NAS-IR-42009404.

e. **Recording Equipment.** ICSS Phase 1B will be equipped with an interface to recording equipment. All transmit and receive signals at a position on interphone, intercom, and A/G channels will be combined into a single signal and recorded. Split position transmit and receive signals will be recorded separately as well as combined. ICSS Phase 1B will interface with recording equipment in accordance with FAA-P-2854a.

f. **RMMS.** The ICSS Phase 1B to RMMS interface will be in accordance with Maintenance Processor Subsystem to Remote Maintenance Subsystem and Remote Monitoring Subsystem Concentrator, NAS-MD-790. A Letter of Agreement (LOA) has been developed with the office of the Associate Program for Engineering, Maintenance Automation Program, ANA-120, which outlines the roles and responsibilities for

implementing the RMMS. The LOA states that the design and implementation of the ICSS Phase 1B to RMMS interface will be delayed until approximately 1995. This delay will eliminate design requirements for the contractor until after the majority of the ICSS Phase 1B systems have been fielded and are operational. When RMMS is implemented, existing ICSS Phase 1B systems will be retrofitted.

g. **Administrative Telephone System (ATS)**. An ATS will be provided by the contractor to interface with the ICSS Phase 1B, the central office of the Public Switched Telephone Network (PSTN) and FTS. If the site receiving the ICSS Phase 1B already has a fully functional ATS, then an ATS will not need to be ordered. The ICSS Phase 1B will interface with the ATS in accordance with NAS-IR-42009400.

34. **POSITION INSTRUMENTS**. All position instruments for the ICSS Phase 1B will be six-wire instruments and will use a PJ-7 (WE425) jack. Position instruments should conform to the transmission characteristics of FAA-P-2854a. Failure to use equipment which conforms to these transmission characteristics may adversely affect audio transmission and performance. Headset jacks for the ICSS Phase 1B will provide a 50 ohm termination on the transmit side and a 600 ohm termination on the receive side. Accordingly, when transmitting test tones through the headset jack, a 600 to 50 ohm line transformer will be required to match the transmit impedance. A -10 dBm tone into a 50 ohm load will produce 70.8 millivolt rms AC.

a. **Headsets**. Headsets must conform to FAA-E-2603, Noise Canceling Headset and Handset. Plantronics 0311-XX (XX = cord length, 10, 15 or 25 foot) or equivalent will meet the required ICSS Phase 1B transmission and safety criteria.

b. **Handsets**. Handsets must conform to FAA-E-2603. PTS-500TC, manufactured by Walker Equipment or equivalent will meet the required ICSS Phase 1B transmission and safety criteria.

c. **Hand Microphones**. Hand microphones must conform to FAA-E-2162b, Microphone, Hand-held.

d. **Footswitch**. Footswitch must conform to FAA-E-2170, Switch, Foot-Bar.

35. **TRANSMISSION PLAN**. The Transmission Plan for the ICSS Phase 1B can be found in appendix 4.

36.-39. **RESERVED**.

CHAPTER 4. PROJECT SCHEDULE AND STATUS

40. **PROJECT SCHEDULE AND GENERAL STATUS.** The project schedule for ICSS Phase 1B implementation is from the summary milestone schedule presented in the Program Director Status Review (PDSR). The Summary Milestone Schedule is maintained and updated by the System Engineering and Integration (SEI) contractor planning organization. This schedule is primarily concerned with system level I and II milestones and is updated when there are major program adjustments.

41. **MILESTONE SCHEDULE SUMMARY.** The milestones that pertain to the ICSS Phase 1B project implementation are presented in figure 4-1.

42. **INTERDEPENDENCIES AND SEQUENCE.** ICSS Phase 1B installation is not dependent on completion of any outstanding projects.

43. **MATERIAL DELIVERY DATE FILE (MDDF).** The ICSS Phase 1B project is contained in the MDDF. The MDDF is the official repository for project end-item equipment and software delivery information. The MDDF is a part of the Regional Project Management System (RPMS) and it will provide delivery information for all Facilities and Equipment (F&E) major end-items.

44.-49. **RESERVED.**

FIGURE 4-1. ICSS PHASE 1B MILESTONE SCHEDULE

PROCUREMENT REQUEST APPROVED	JAN-10-90
INITIATE THE DEPLOYMENT READINESS REVIEW (DRR) PROCESS	JAN-30-90
TPL APPROVED BY AOA-1	JAN-30-90
SOLICITATION ISSUED	APR-24-90
PRE-PROPOSAL CONFERENCE	MAY-17-90
DRR TEAM MEETING	JUN-19-90
CONTRACT AWARDED	T
SYSTEM DESIGN REVIEW (SDR) ¹	T + 3 (months)
FIRST ARTICLE TESTING COMPLETED ²	T + 8
FUNCTIONAL CONFIGURATION AUDIT (FCA)	T + 6
PHYSICAL CONFIGURATION AUDIT (PCA)	T + 6
FIRST SITE SURVEY	T + 7
SYSTEM DELIVERED TO FIRST OPERATIONAL FIELD SITE	T + 9
FIRST SITE CHECKOUTS, INTEGRATION, AND ACCEPTANCE TESTING COMPLETED	T + 10
CONTRACTOR ACCEPTANCE INSPECTION (CAI) ³	T + 10
ACN-100 INTEGRATION TESTING COMPLETED	T + 12
INITIAL OPERATING CAPABILITY (IOC)	T + 12
ASM-600 SHAKEDOWN TESTING COMPLETED	T + 13
DEPLOYMENT DECISION/DRR EXCOM	T + 14
FIRST OPERATIONAL READINESS DEMONSTRATION (ORD) ⁴	T + 15
FIRST JOINT ACCEPTANCE INSPECTION (JAI)	T + 15
SYSTEM DELIVERED TO LAST OPERATIONAL SITE	T + 56
LAST ORD COMPLETED	T + 59

¹. The FAA, SEI, and the ICSS Phase 1B contractor participate in SDR.

². The contractor will conduct the First Article Test at the contractor's facility.

³. CAI is the point in time when the FAA takes control of the equipment and FAA integration testing begins.

⁴. ORD is the formal demonstration that precedes the JAI which marks the commissioning of the equipment.

CHAPTER 5. PROJECT MANAGEMENT

50. **PROJECT MANAGEMENT, GENERAL.** The successful implementation of this project requires elaborate coordination procedures and activities involving a number of headquarters, regional, and field organizations. Implementation activities also involve the ICSS Phase 1B Program Office, the FAA Technical Center, FAA Academy, FAA Logistics Center, the SEI and the ICSS Phase 1B contractor. Paragraphs 51 through 54 provides a comprehensive listing of the organizations involved in the implementation by the area of responsibility within the ICSS Phase 1B project.

The Voice Switching and Recording Program, ANC-200, has primary responsibility for the implementation of the ICSS Phase 1B. The following matrix, figure 5-1, relates the organizations with primary responsibility for assisting ANC-200 in the implementation of the ICSS Phase 1B.

FIGURE 5-1. OVERALL MANAGEMENT MATRIX

Management Area	A C N 1 0 0	A N S 4 2 0	A S M 2 6 0	A T Z 1 0 0	A S E 6 0 0	A S M 3 0 0	A N S 2 0 0	A T R 1 0 0
Test & Evaluation	X							
NAILS		X						
AF Training			X					
AT Training				X				
Configuration					X			
Management						X	X	
Site Requirements								X

51. **PROJECT CONTACTS.** See appendix 3 for a list of project management personnel designated as contacts for the ICSS Phase 1B project.

52. **PROJECT COORDINATION.** See figure 5-2 for a list of the organization names and routing symbols and the organization's associated coordination responsibility.

53. **PROJECT RESPONSIBILITY MATRIX.** See figure 5-3 for an explanation of which organizations have responsibility for participation in major ICSS Phase 1B

FIGURE 5-2. ICSS PHASE 1B PROJECT COORDINATION

ORGANIZATION	ORGANIZATION TITLE	COORDINATION REQUIREMENTS
AAC-400	FAA Logistics Center	Logistics Support
AAC-900	FAA Academy	Training Conduct
AAF-11	Planning Branch	DRR Conduct
ACN-100	Automation Division	Testing Conduct, NAS Operational Test and Evaluation (OT&E)/Integration Testing
AHT-400	Airway Facilities (AF) Training Program Division	AF Training Statement of Work Development
AHT-500	Air Traffic (AT) Training Program Division	AT Training Statement of Work Development
ANC-200	Voice Switching and Recording Program	Program Management
ANS-200	Facilities Integration Division	Tower Structures Program
ANS-420	NAILS Implementation Branch	Logistics Support
ASE-600	Configuration Management and Engineering Support Division	Control of Configuration Management
ASM-100	Maintenance Engineering Division	Maintenance Requirements
ASM-260	Operations Program Branch	AF Training Program Branch
ASM-600	National Engineering Field Support Division	Engineering and Maintenance Support, NAS OT&E/Shakedown Testing
ATR-100	System Plans & Programs Division	AT Requirements
ATZ-100	Field Development Program	AT Training Proposal Development

implementation tasks. Figure 5-3 provides the paragraph number and title for each task listed.

54. PROJECT MANAGERIAL COMMUNICATIONS. This paragraph provides a listing of meetings, conferences, and design reviews.

a. Meetings, Conferences, and Design Reviews.

(1) **System Design Review (SDR).** The SDR is to validate the contractor's design against FAA-P-2854a. The SDR will also evaluate contractor system management activities. At the request of ANC-200, the contractor will conduct an SDR

FIGURE 5-3. PROJECT RESPONSIBILITY MATRIX

PAR. #	PARAGRAPH TITLE	A N C 2 0 0	A C N 1 0 0	A N S 2 0 0	A N S 4 2 0	A A F 1 1	A S M 2 6 0	A S M 6 0 0	A S E 6 0 0	A H T 4 0 0	A H T 5 0 0	A A C 4 0 0	A T Z 1 0 0	A A C 9 0 0	Q R O	R E G I O N	S I T E
54	Managerial Communications	X			X		X				X	X	X				
55	Implementation Staffing	X	X												X	X	X
56	Plans and Reports	X	X					X	X								X
60	Project Funding Status	X		X												X	
70	General Deployment Aspects					X											
71	Site Preparation															X	X
72	Delivery															X	
73	Installation															X	
81	Factory Verification		X												X		
82	Site Verification		X														
a	Checkouts		X													X	
b	Contractor Integration Testing		X													X	
c	Site Acceptance Testing		X													X	
d	CAI															X	X
e	NAS OT&E/Integration Testing		X													X	
f	NAS OT&E/Shakedown Testing							X								X	
g	IOC	X						X								X	
h	JAI															X	X
i	Reliability Assurance	X	X													X	
91	Training						X			X	X		X	X			
94	Vendor Data and Tech. Manual							X									
100	Configuration Management	X						X	X					X			

X Signifies first site only.

to validate all functions of the ICSS Phase 1B.

(2) **Training Conference.** ANS-420 will coordinate with ASM-260, ATZ-100, AHT-400, and AHT-500 in preparing for a training conference. The training conference will be conducted at the contractor's facility 30 days after contract award.

The intent of the training conference is to provide the contractor with an overview of the ICSS Phase 1B training requirements.

(3) Provisioning Conference. After completion of SDR, FCA and PCA, and acceptance of Provisioning Parts List (PPL) by the FAA, the NAS project and provisioning section, AAC-485 will notify ANS-420 that they are ready for the provisioning conference. ANS-420 will then request a provisioning conference to be held at the contractor's facility. The intent of the conference is for the FAA to validate the master parts list and to determine the types, levels, and quantities of spare parts necessary to support the ICSS Phase 1B.

(4) National Airspace Integrated Logistics Support Management Team (NAILSMT). The Associate Program Manager for Logistics (APML) will be responsible for scheduling and chairing the NAILSMT meetings and integrating the work of the other support organizations. The purpose of the NAILSMT is to discuss and resolve maintenance, training, and other logistics issues. NAILSMT meetings will be held at either the contractor's facility or at a Government facility. A NAILSMT was held at the Aeronautical Center for the ICSS Phase 1B in July 1990.

(5) Post Award Conference. Post Award Conference (PAW) will take place 30 days after contract award. The contractor provides the agenda and shall be prepared to discuss the current program status, which shall include contract options, site preparation, site installations, production schedules and progress, cost, and any technical issues.

(6) Logistics Guidance Conference. The contractor shall participate with FAA representatives in a logistics/provisioning guidance conference held at a Government facility, unless otherwise stated by the Government. The contractor shall be prepared to discuss contractor's integrated support plan, logistics support analysis, provisioning, and provisioning technical documentation.

(7) Technical Interchange Meeting. The contractor shall plan and conduct Technical Interchange Meetings (TIM's) as the FAA deems it necessary. The purpose of the TIM's are to review the system requirements and contractor's performance. Unless otherwise stated, TIM's shall be held at the contractor's facility.

b. Terminal Voice Switch Newsletter. A Terminal Voice Switch Newsletter is published every 2 months. This newsletter provides information of a general nature concerning the deployment and implementation of Terminal Voice Switching Systems including the ICSS Phase 1B. ANC-200 has primary responsibility for this newsletter,

which is distributed to all regional offices, selected FAA headquarter offices, and FAA Technical Center divisions.

55. **IMPLEMENTATION STAFFING**. Staffing peculiar to the implementation phase of the contract will involve the following personnel:

a. **Quality and Reliability Officer (QRO)**. The ICSS Phase 1B contracting officer in cooperation with ALG-400 will assign a QRO to represent the contracting officer at the factory. The QRO's responsibilities will include working closely with the contractor in the inspection and acceptance of all ICSS Phase 1B equipment at the factory. The QRO will be responsible for:

- (1) Monitoring factory verification in compliance with contract requirements.
- (2) Monitoring production progress.
- (3) Expediting the delivery of ICSS equipment to the site.
- (4) Coordinating with the contracting officer and ANC-200 any proposed technical changes.
- (5) Providing copies of contractor generated correspondence and documentation to the contracting officer and to ANC-200.
- (6) Providing weekly status reports to the contracting officer and to ANC-200.

b. **Technical Officer (TO)**. The contracting officer will assign a TO, to assist in all administrative and technical matters with the contractor. The TO will be responsible for:

- (1) Informing the contracting officer and ANC-200 of all technical and contractual difficulties encountered.
- (2) Informing the contracting officer and ANC-200 as to the status of work progress.
- (3) Providing notification of meetings and copies of all correspondence to the contracting officer and to ANC-200.

(4) Providing needed documentation to the regions including order ICSS Phase 1B PIP, and the Master Test Plan.

c. Regional Personnel. Through its Telecommunications and Spectrum Engineering Branch, each region will be responsible for:

(1) Assigning personnel to act as Technical Onsite Representatives (TOR) for the site or sites in that region that will receive an ICSS Phase 1B.

(2) Ensuring that all engineering activities as outlined in paragraph 71a have been completed.

d. Site TOR. TOR's will witness and participate in the installation, integration, and verification of the ICSS Phase 1B switches. Responsibilities include:

(1) Serving as the central point of contact for all matters pertaining to site installation activities.

(2) Identifying and coordinating with personnel who will participate in site preparation meetings and installation efforts.

(3) Providing the contractor with access to the site.

(4) Ensuring that contractor installation procedures meet FAA installation standards.

(5) Informing the region and TO of all technical and contractual difficulties encountered.

(6) Informing the region and TO as to the status of site preparation and installation.

(7) Informing the region and TO as to the status of deliveries and work progress.

(8) Identifying power and grounding connection points, internal facility cable raceways, buried or hidden utilities relative to the installation effort.

(9) Ensuring that all requirements for ringing supply have been satisfied (see subparagraph 36b).

(10) Certifying the performance of the ICSS Phase 1B equipment at IOC (see paragraph 82g).

e. **Associate Program Manager for Test (APMT)**. The Engineering, Test and Evaluation Service director, ACN-1, will appoint an APMT to act as a representative of ANC-200 and to oversee the Test and Evaluation (T&E) program. The APMT will be responsible for:

- (1) Reviewing test and evaluation (T&E) plans and procedures.
- (2) Coordinating with supporting organizations regarding all T&E activities.
- (3) Reviewing site acceptance plans and procedures.
- (4) Monitoring and witnessing all contractor performed test activities.
- (5) Developing and maintaining OT&E/integration test plans, procedures and reports.
- (6) Conducting FAA integration testing.
- (7) Monitoring FAA shakedown testing.
- (8) Reviewing and analyzing contractor generated test results and test reports.
- (9) Developing and distributing OT&E/integration test reports.

56. **PLANS AND REPORTS.**

a. **Project Implementation Plan**. The PIP will be prepared and maintained by ANC-200. The PIP will provide technical guidance and management direction for the orderly implementation of the ICSS Phase 1B.

b. **FAA Master Test Plan**. The FAA Master Test Plan was prepared jointly by ANC-200 and the Voice Switching Automation Division, ACN-100 and serves as the overall test document. ANC-200 and ACN-100 coordinated the approval of the Master Test Plan with the Test Policy and Planning Review Board (TPRB) in accordance with the current version of Order 1810.4, FAA NAS Test and Evaluation. The FAA Master Test Plan coordinates the efforts of all organizations involved in the verification of the

ICSS Phase 1B and outlines the T&E tasks necessary to support the implementation and deployment of the ICSS Phase 1B including the following:

- (1) Production Acceptance Test and Evaluation (PAT&E).
- (2) NAS OT&E/integration (OT&E integration).
- (3) NAS OT&E/shakedown (OT&E shakedown).

c. **Program Management Plan.** The Program Management Plan will be prepared and maintained by the contractor. ANC-200 will have primary responsibility in the review and approval of the Program Management Plan.

d. **Contractor Master Test Plan.** The Contractor Master Test Plan will be prepared by the contractor. This plan will serve as the overall test document and will reflect the contractor's overall test activities. ANC-200, ACN-100, and ASM-600 will be responsible for reviewing and approving the Contractor Master Test Plan.

e. **Site Installation Management Plan.** The Site Installation Management Plan will be prepared and maintained by the contractor. This plan will explain all site installation activities. ANC-200 and ACN-100 will be responsible for reviewing and approving the Site Installation Management Plan.

f. **Site Installation, Integration, and Acceptance Plan.** A Site Installation, Integration and Acceptance Plan will be developed by the contractor for each site. ANC-200, ACN-100, ASM-600, and the regions will be responsible for reviewing and approving the Site Installation, Integration and Acceptance Plan. ANC-200 will provide a copy of the Site Installation, Integration, and Acceptance Plan to the specific region for use in the installation of the ICSS Phase 1B.

g. **Site Cutover Plan.** A Site Cutover Plan will be developed by the contractor to describe the proposed procedures to be used in achieving operational status. The regions will have primary responsibility in approving the Site Cutover Plan and will hold meetings with the contractor to discuss these plans.

h. **Integrated Logistics Support Plan.** An Integrated Logistics Support Plan (ILSP) has been written for the ICSS Phase 1B. The ILSP contains the FAA support concept which will be considered by the contractor in the development of the contractor's Integrated Support Plan (ISP). ANS-420, with the assistance of the NAILSMT, prepared the ILSP and approved the document jointly with ANC-200.

i. **Configuration Management Plan.** A Configuration Management Plan will be developed and maintained by the contractor in accordance with FAA-STD-021a, Configuration Management. This plan will document all contractor configuration management responsibilities and procedures. ANC-200 and ASE-600 will be responsible for reviewing and approving the Configuration Management Plan.

j. **OT&E/Integration Test Plan.** An OT&E/integration test plan will be developed and maintained by ACN-100 in accordance with FAA-STD-024a. This plan will specify the activities that will be performed during OT&E/integration. The plan will contain a test verification requirements traceability matrix (TVRTM) specifying the test procedures and verification methods to be used to satisfy each allocated requirement.

k. **OT&E/Shakedown Test Plan.** ASM-600 will be responsible for the development of this test plan. The OT&E/Shakedown tests will exercise the ICSS Phase 1B system in an operational environment to support the determination that the system is ready for full deployment of part of the NAS. This test plan will consider the development of procedures which will identify operational deficiencies in the areas of training, logistics, documentation, personnel safety, security, software, maintenance, preventive maintenance, field maintenance and in the adequacy of system failure detection and recovery procedures. This test activity will be conducted at the first operational site and must be satisfactorily completed to support a deployment decision during the DRR/Executive Committee meeting.

l. **Problem Reports.** The region will maintain an installation log of open items (problems that require resolution) throughout the implementation effort and incorporate this information into a quarterly report. In this report, the TOR will identify any problems encountered and the contractor's proposed solution. The TOR will prepare this report and submit it to the TO no later than 15 days following the end of each quarter.

m. **Program Status Reports.** Program status reports along with major milestone charts will be prepared by the contractor on a monthly basis to apprise the FAA of the status of the program schedule, identify problem areas, proposed solutions, and efforts underway to implement solutions. These reports will identify all problem areas and compare the current program status against the projected program milestones. Program status reports will be prepared in accordance with Contract Data Requirements List (CDRL) 004.

n. **Site Survey Reports.** Detailed site survey reports will be prepared by the contractor. These reports will specify the onsite technical details for installing the ICSS

Phase 1B. One site survey report will be prepared for each system location. Site survey reports will be prepared in accordance with CDRL 018.

o. Test Reports. Test reports will be prepared by the contractor to evaluate compliance of the system under test to the ICSS Phase 1B specification. The contractor will provide these reports based on data obtained from formal testing of the ICSS Phase 1B. These reports will include precise information regarding the routing of primary power, communication lines, cabling and ducting requirements. Test reports will be prepared in accordance with CDRL 015. Test reports will also be prepared by ACN-100 for OT&E/integration testing and by ASM-600 for OT&E/shakedown testing.

57. APPLICABLE DOCUMENTS. See appendix 2 for a list of applicable documents.

58.-59. RESERVED.

CHAPTER 6. PROJECT FUNDING

60. PROJECT FUNDING STATUS, GENERAL.

a. This program involves the procurement of ICSS Phase 1B systems through full and open competition. Funding estimates for the ICSS Phase 1B project were derived from existing ICSS contracts for similar voice switching equipment. Funding for the ICSS Phase 1B acquisition along with one year of logistics support, following completion of the reliability demonstration period, will come from F&E funds programmed through ANC-200. Depot-level support will be funded and managed by AAC-400. The ICSS Phase 1B contract will allow acquisition by either lease or purchase but the lease option will be exercised only if F&E funding is insufficient at the time an order for an ICSS Phase 1B switch is placed with the contractor.

b. The delayed installation of the RMMS (see paragraph 33f) onto the ICSS Phase 1B will be funded by ANC-200.

c. Although the ICSS Phase 1B project is primarily designed to replace existing electromechanical switching systems, ICSS Phase 1B equipment can be procured to satisfy the needs of new, modernized, or relocated ATCT and TRACON facilities. Funds to procure voice switches for these facilities will be provided by ANS-200 or the specific program office needing the ICSS Phase 1B.

61.-69. RESERVED.



CHAPTER 7. DEPLOYMENT

70. GENERAL DEPLOYMENT ASPECTS. The primary vehicle for planning system deployment is the DRR. The Planning Branch, AAF-11, has the primary responsibility for conducting the DRR in accordance with Order 1800.63, National Airspace System (NAS) Deployment Readiness Review (DRR) Program.

a. The DRR defines the managerial strategy used by the ICSS Program Manager to facilitate an FAA review. The review ensures that the ICSS Program is ready for integration into the NAS and that the regions are prepared to receive ICSS Phase 1B systems. AAF-11 is responsible for leading the review process and presenting a report to the NAS Program Director. The following lists the various steps included in the DRR process.

- (1) Initiate DRR process (initial review and announce DRR team meeting).
- (2) Convene DRR team meeting (12 months prior to delivery to T&E site).
- (3) Monthly project checklist updates (every 30 days following initial DRR team meeting).
- (4) Mid-term review.
- (5) Delivery to T&E site/first operational site.
- (6) Shakedown test completed.
- (7) Submit DRR report (1 week after completion of shakedown test).
- (8) Deployment decision (DRR EXCOM meeting).
- (9) Monthly open action item status reports (every 30 days following deployment decision).

b. AAF-11 has established a DRR team. The following organizations are asked to participate in the DRR process.

- (1) FAA Headquarters

Communications	ANC
NAS System Engineering Service	ASE
Systems Maintenance Service	ASM
Advanced Automation	AAP
Office of Acquisition Support	ASU
Air Traffic Plans and Requirements Service	ATR
Flight Standards Service	AFS
Automation	ANA
Office of Training and Higher Education	AHT
Office of Civil Aviation Security	ACS
Office of Labor and Employee Relations	ALR
Executive Director for System Development	AXD
NAS Transition and Implementation Service	ANS

(2) FAA Field Locations

Flight Standards Division	All regions
Civil Aviation Security Division	All regions
Logistics Division	All regions
FAA Technical Center	ACN
Mike Monroney Aeronautical Center	AAC
Aviation Standards National Field Office	AVN
Airway Facilities Division	All regions
Air Traffic Division	All regions

71. SITE PREPARATION. Site preparation for an ICSS Phase 1B system will begin after the requirement for a system has been validated by ATR-100, the appropriate region has submitted a site specific cost estimate for site preparation to ANC-200, and a Project Authorization (PA), to provide the required funding, has been issued.

a. Engineering and Site Preparation. The region is responsible for managing the engineering and accomplishing the site preparation as outlined in subparagraphs (1) - (9) and for overseeing ICSS Phase 1B site preparation as outlined in paragraph 55d. The region will be responsible for:

- (1) Removing existing equipment.
- (2) Providing the necessary floor space.
- (3) Providing an AC distribution panel solely for the use of ICSS Phase 1B equipment (this will eliminate excess noise into the central equipment).

(4) Ensuring that a grounding survey is conducted and a grounding system is provided in accordance with FAA-STD-019b, Lightning Protection, Grounding, Bonding and Shielding Requirements for Facilities.

(5) Providing a signal ground plate and a chassis ground plate for the ICSS Phase 1B equipment.

(6) Coordinating with the TOR that incoming telco lines have a telco installed signal ground (to avoid ground potential differences, the telco ground should also use an FAA ground).

(7) Providing facilities for site preparation and site survey meetings.

(8) Ensuring that all transmission levels and objectives are provided as specified in appendix 4.

(9) Providing to the TOR all approved documentation required for implementation. This documentation includes Telephone Service Requests (TSR), site survey reports, instruction books and site installation, integration, and acceptance plans.

b. **FAA Site Survey.** The region will coordinate with the AXX-510 and conduct an FAA site survey to determine site requirements to accurately order the needed equipment. Once the FAA site survey is completed, the region will be responsible for conducting a meeting in preparation for the contractor conducted site survey. The region may elect to conduct the meeting immediately prior to the contractor conducted site survey. Attendees of the meeting should include representatives of AXX-450, AXX-510 and the contractor, along with the TOR. The following items list specific information to be gathered during the FAA site survey.

- (1) Number of operator positions.
- (2) Number of split positions.
- (3) Number of headsets, handsets, and microphones.
- (4) Number of frequencies.
- (5) Number and identification of G/G interfaces.
- (6) Number and identification of A/G interfaces.

(7) Identification of any ATS and Uninterruptible Power Supply (UPS) requirements.

c. **Contractor's Site Survey.** The contractor will have the responsibility for scheduling the site survey with the appropriate regional personnel and attending all site survey meetings and briefings. The contractor will visit the ICSS Phase 1B site and perform a site survey. The contractor will perform the site survey 3 to 4 months prior to equipment installation. A site survey report will be prepared by the contractor and will be forwarded to the respective region and ANC-200 for approval. The report will be delivered no later than 30 days after completion of the site survey. The following items will be included in the site surveys.

- (1) Equipment to be installed or removed.
- (2) Protection of equipment, floors, walls, and other site appurtenances.
- (3) Grounding and bonding requirements.
- (4) Routing of primary power, communication lines, cabling and ducting.
- (5) Power panel capacity.
- (6) Demarcation wiring termination identification.
- (7) Position equipment configuration and type determination.

72. **DELIVERY.** The following paragraphs describe the major FAA and contractor activities and prerequisites for ICSS Phase 1B delivery to each site.

a. **Contractor Responsibilities.** The contractor will ship all ICSS Phase 1B material and equipment from the contractor's plant to the designated site. The contractor will be responsible for the off-loading, moving, and placing of equipment at the designated sites. The TOR will provide cleared areas in accordance with the approved requirements in the Site Survey Report. The contractor is also responsible for activities relating to assembly, packing, and receiving. All site-specific items ordered by the Government from the contract will be delivered to each site by the contractor.

b. **FAA Responsibilities.** The TOR is responsible for ensuring that site preparation and engineering is completed in accordance with paragraph 71. The TOR has the responsibility to ensure that the following actions have been completed.

- (1) Contractor has provided names of installation team members.
- (2) Space is available for delivery trucks.
- (3) Loading dock space is available.
- (4) Parking space is available for contractor personnel.

c. **Delivery Process.** Subparagraphs 72c(1) through (3) describe the ICSS Phase 1B delivery process.

(1) **Off-load.** The contractor will provide the personnel and devices (i.e. forklifts, dollies, and tools) to unload vans, unpack crates, dispose of packing material and deliver equipment and material to the appropriate areas. The TOR will provide site security (badges, escorts, observers), delivery dock access, and delivery routes (internal and external).

(2) **Inspection and Inventory.** The contractor will uncrate, inspect, and inventory each item.

(3) **Internal Delivery.** The TOR will verify that delivery routes and areas are ready for delivery. The contractor will deliver ICSS Phase 1B equipment and material to the proper areas as items are inventoried.

73. **INSTALLATION.** The contractor shall prepare a site installation management plan governing all site installation activities as described in subparagraphs 73a and 73b.

a. **Contractor Installation.** The contractor will have the following responsibilities.

- (1) Installing an ICSS Phase 1B system at each ICSS Phase 1B site.
- (2) Provide the equipment, software, materials, and services required for each of these efforts.
- (3) Exercising quality control and, during installation, the contractor will provide full-time supervision of its personnel and of any subcontractors.
- (4) Install the entire ICSS Phase 1B including the ATS and UPS if ordered.

b. **Installation Sequence.** The installation details outlined in subparagraphs (1) -

(11) will generally be accomplished in the order shown but may be changed by the contractor with the TOR's approval.

- (1) Receive, unpack ICSS Phase 1B equipment.
- (2) Locate and secure ICSS Phase 1B position equipment.
- (3) Install ICSS Phase 1B racks.
- (4) Install inter-rack cabling.
- (5) Install ICSS Phase 1B equipment in racks.
- (6) Install module controllers for the various consoles.
- (7) Install position modules.
- (8) Route and connect cables.
- (9) Install the grounding distribution system.
- (10) Install the power distribution system including UPS.
- (11) Install and place in service the ATS.

74.-79. RESERVED.

CHAPTER 8. VERIFICATION

80. **GENERAL VERIFICATION**. This order discusses the requirements and responsibilities for verification of the ICSS Phase 1B in two major areas according to the location of the verification activity. These areas include factory verification and site verification.

81. **FACTORY VERIFICATION**. The FAA and the contractor conduct formal factory testing and verification of the ICSS Phase 1B at the contractor's facility. The contractor has primary responsibility for conducting ICSS Phase 1B Factory Verification and will maintain a log of all formal testing. Subparagraphs 81a through 81c discuss the categories of Factory Verification of the ICSS Phase 1B.

a. **First Article Testing**. First article testing will provide a comprehensive test of the first production system to ensure that the requirements of FAA-P-2854a, are verified. The contractor will conduct a first article test on the first system ordered in accordance with the FAA approved contractor's Master Test Plan. First article testing will be conducted on a complete system assembled at the contractor's facility. The contractor will provide all test equipment, special tools such as card extenders and inserts, and the emulators necessary to simulate the ICSS Phase 1B environment for all tests which involve outside facilities. First article testing will also include the following tests:

- (1) Environmental qualification tests.
- (2) Thermal/vacuum tests.
- (3) Electromagnetic compatibility and electromagnetic interference tests.

(4) **System Maintainability Demonstration**. Maintainability, a characteristic of design and installation affected by various personnel and logistic factors, is just one of many system requirements to be considered during factory verification. The contractor will conduct a System Maintainability Demonstration on the first system ordered as part of First Article Testing and in accordance with MIL-STD-471A, Maintainability Verification/Demonstration/Evaluation. The objectives of this test are as follows:

(a) Determine whether specific maintainability contractual requirements have been achieved.

(b) Demonstrate depot-level maintenance tasks.

b. **Factory Acceptance Testing.** Factory acceptance testing will be conducted by the contractor at the contractor's facility on each system, prior to shipment to the site. The purpose of this test is to ensure that the system is equipped as required and that all functions are performed in accordance with FAA-P-2854a. Factory acceptance testing will also include type tests. Type tests will be conducted to demonstrate compliance of the system with specification requirements when the system is subjected to various environmental conditions.

c. **FAA Responsibilities for Factory Verification.** ACN-100 and the Quality Reliability Officer (QRO) are responsible for overseeing the factory verification phase and ensuring that factory verification is properly conducted according to the contractor Master Test Plan and the FAA approved contractor's test procedures. Figure 8-1 shows the organization and their responsibilities for factory verification.

FIGURE 8-1. FAA FACTORY VERIFICATION RESPONSIBILITIES

RESPONSIBILITY	A N C 2 0 0	A C N 1 0 0	A S M 6 0 0	Q R O
Monitor Quality Control Program				X
Review and approve contractor test plans and procedures	X	X		
Ensure that position instruments have been provided for operational testing	X			
Participate in and observe testing	X	X	X	X
Attend test reviews and test briefings	X	X		X
Ensure that tests that fail are analyzed and corrected and the test completed		X		X

82. **SITE VERIFICATION.** ACN-100 has primary responsibility for overseeing formal site testing and verification of the first site. The TOR will assume this responsibility for all subsequent ICSS Phase 1B sites. Thus for the purposes of this order, the notation "ACN-100 (TOR)" will be used to indicate that ACN-100 is responsible for the first site whereas the TOR will be responsible for all subsequent sites. There are 9 major areas of site verification. Figure 8-2 provides an overview of these 9 major areas of site verification. Subparagraphs 82a through 82i provide detail for these major areas.

a. **Checkouts.** Upon delivery of the ICSS Phase 1B equipment, the contractor

FIGURE 8-2. SITE VERIFICATION ACTIVITIES

PAR. 82	TITLE	PURPOSE
a.	Checkouts	Contractor verifies proper equipment installation.
b.	Contractor Integration	Contractor verifies proper connections to GFE.
c.	Site Acceptance	Contractor ensures that the ICSS Phase 1B functions correctly.
d.	CAI	The TOR verifies the successful measurement of all handbook parameters and ensures that the ICSS Phase 1B meets contractual requirements and accepts the system from the contractor.
e.	NAS OT&E/Integration*	ACN-100 (TOR) shows that the ICSS Phase 1B interfaces with the existing NAS environment and meets the users defined effectiveness and suitability requirements.
f.	NAS OT&E/Shakedown*	ASM-600 shows that the ICSS Phase 1B can be used and maintained by personnel in the operational environment.
g.	IOC	TOR audit shows that all requirements for operational use are in place.
h.	JAI	Formal FAA audit shows that the ICSS Phase 1B is properly and completely implemented.
i.	Reliability Assurance	Contractor repairs all hardware and software failures at no cost to FAA for a 7 month period.

* - At first site only.

will be responsible for checkouts of the ICSS Phase 1B equipment in accordance with the approved contractor Master Test Plan. Checkouts will include the ATS and the UPS as ordered.

(1) **FAA Responsibility for Checkouts.** ACN-100 (the TOR) will be responsible for the following:

(a) Approving all contractor site activities and plans for minimal disruption of operations.⁵

(b) Monitoring contractor testing performance.

(c) Ensuring that tests that fail are analyzed, the problem fixed and the test completed or documented for further action.

⁵ The TOR will participate in this activity at the first site and at all subsequent sites.

(d) Recording all data that is required for CAI and JAI completion.

b. **Contractor Integration Testing.** After successful completion of installation and checkouts, contractor integration testing is conducted to verify the proper interfacing of the ICSS Phase 1B equipment to the Government Furnished Equipment (GFE) in accordance with the associated Interface Control Documents (ICD) and Interface Requirement Documents (IRD). The contractor will provide one headset per position and the required number of handsets and microphones during contractor integration testing. These headsets, handsets, footswitches, and microphones will be ordered from the ICSS Phase 1B contract to accommodate all supervisors and controllers using the switch. The specific number of headsets and microphones will be determined as part of the FAA conducted site survey (see subparagraph 71b(3)). Procurement of additional position equipment will be the responsibility of site personnel. Position equipment can be procured through the FAA Logistics Center. Contractor integration testing will include:

(1) Verification that ICSS Phase 1B is correctly integrated with the interfaces that are specified and available at the particular facility.

(2) Verification that the ICSS Phase 1B is electrically and physically compatible with GFE.

(a) **FAA Responsibility for Contractor Integration Testing.** ACN-100 (the TOR) is responsible for:

1 Authorizing the connection of ICSS Phase 1B equipment to GFE equipment and releasing operational circuits for integration.⁶

2 Monitoring and maintaining the status and results of each test.

3 Assuming that tests that fail are analyzed, the problem fixed, and the test completed or documented for further action.

c. **Site Acceptance Testing.** Site acceptance testing will be conducted at each operational site. The testing verifies that the ICSS Phase 1B equipment functions correctly in accordance with the specification. Site acceptance testing will be a subset of first article testing along with any additional tests required to assure the FAA that the system is ready for site acceptance.

⁶. The site TOR is responsible for this activity at the first site and at all subsequent sites.

(1) **FAA Responsibility for Site Acceptance Testing.** ACN-100 (the TOR) will be responsible for:

(a) Monitoring all acceptance testing.

(b) Ensuring that tests that fail are analyzed, the problem fixed and the test completed or documented for further action.

d. **CAI.** The TOR has primary responsibility for CAI. CAI is when the TOR verifies the successful measurement of all handbook parameters and accepts the installed ICSS Phase 1B from the contractor. Upon successful completion of CAI, a Facilities Master File (FMF) change is implemented by site personnel to transfer the ICSS Phase 1B from preconstruction to test mode.

e. **NAS OT&E/Integration Testing.** ACN-100, at the FAA Technical Center, will be responsible for the development of the OT&E Integration Test Plan and procedures. The OT&E/Integration Test Plan will specify the approach that will be used to verify that the ICSS Phase 1B system can be successfully integrated into the NAS. Tests will be developed to verify the operational suitability and operational effectiveness of the ICSS Phase 1B system. Test planning will address simulation of the NAS environment where applicable. All test results will be properly recorded and analyzed. OT&E/integration tests will be conducted at the FAA Technical Center and at the test site.

f. **NAS OT&E/Shakedown.** The purpose of NAS OT&E/shakedown is to determine the overall readiness of the ICSS Phase 1B system and its support elements. It will determine the degree to which the system meets the NAS operational requirements when operated and maintained by the end users. NAS OT&E/shakedown will also verify that the ICSS Phase 1B functions reliably, meets operational requirements and is maintainable. ASM-600 along with a test team comprised of AFS, regional Airway Facilities personnel (AXX-4xx), and Regional AT Personnel (Axx-5xx) will perform NAS OT&E/shakedown after the FAA has taken full responsibility for the ICSS Phase 1B system. This phase leads to the integrated readiness of all personnel, procedures, and equipment involved in operational use. ASM-600 along with the test team will be responsible for:

(1) Developing NAS OT&E/shakedown plans and procedures.

(2) Ensuring that NAS OT&E/shakedown prerequisites such as training and site preparation are satisfied.

(3) Conducting the onsite NAS OT&E/shakedown to ensure that the

system and all support requirements to operate and integrate the system into the NAS are present and satisfactory.

- (4) Ensuring that tests that fail are analyzed and documented.
- (5) Making a decision as to the criticality of the problem before implementation of the system into the NAS.
- (6) Performing retests if required.
- (7) Reporting the results of NAS OT&E/shakedown to the DRR EXCOM.

g. **IOC.** The IOC is the point in time when the ICSS Phase 1B equipment has been installed and tested and meets all defined requirements and the system is ready for cutover. The declaration of IOC also serves as a milestone in the JAI of the ICSS Phase 1B. During IOC, ANC-200⁷, the TOR and site personnel agree that the ICSS Phase 1B is physically and functionally capable of replacing existing voice switching equipment. Once the system has been successfully cutover, the region is responsible for providing certification of the ICSS Phase 1B system in accordance with Order 6480.6B, Maintenance of Terminal Air/Ground Communication Facilities.

(1) **Cutover.** The cutover is to transition the ICSS Phase 1B from a test environment to an operationally ready state with minimal impact on ATC operations. The TOR has primary responsibility for overseeing the Cutover of the ICSS Phase 1B while the contractor assumes a support role. The TOR will be responsible for:

- (a) Coordinating with AXX-450, or AXX-430 as appropriate, and AXX-510 as to when the Cutover will be performed.
- (b) Conducting a meeting with AXX-450, or AXX-430 as appropriate, and AXX-510 to approve the contractor's cutover procedures.

h. **JAI.** JAI is the formal acceptance by AT and AF from the TOR of the ICSS Phase 1B system prior to the operational readiness demonstration of an installed and operational ICSS Phase 1B. JAI will be conducted by a Joint Acceptance Board after successful completion of the NAS OT&E/shakedown test and in accordance with Order 6030.45, Facility Reference Data File. A representative from the sector office will act as chairman of the Joint Acceptance Board. The Joint Acceptance Board will consist of, but will not be limited to, representatives from the following organizations:

⁷. ANC-200 participates in the IOC at the first operational site only.

- (1) ACN-100.
- (2) TOR.
- (3) AXX-510.
- (4) AXX-450 or AXX-430.
- (5) Airway Facilities Maintenance Engineering Branch, AXX-460.

(6) Operational Readiness Demonstration (ORD). ORD is the final stage of JAI. ORD will include the investigation and research of records and requirements, as well as the documentation of all inspections, tests, and demonstrations required to assure the FAA that the ICSS Phase 1B adequately meets all the operational, engineering, and maintenance requirements and is ready to be formally placed into operational use.

i. Reliability Assurance. The reliability assurance is the final stage of site verification. The TOR has primary responsibility for ensuring that the contractor correctly and adequately performs reliability assurance on the equipment. Under reliability assurance, the contractor will repair, at no cost to the FAA, all hardware, software, and firmware failures that occur to each system during the first 7 months after site acceptance. During this period, the contractor will be available 7 days a week and 24-hours per day. The contractor will be required to arrive at the site within 2-hours after notification of an equipment failure.

83.-89. RESERVED.



CHAPTER 9. INTEGRATED LOGISTICS SUPPORT

90. **MAINTENANCE CONCEPT.** The ICSS Phase 1B maintenance concept will ensure maximum availability of the ICSS Phase 1B hardware and software. ANS-420 will have primary responsibility for overseeing all matters concerning system life cycle support. ANS-420 with the assistance of the NAILSMT prepared the ILSP for and jointly approved the ILSP with ANC-200. The contractor will provide two levels of ICSS Phase 1B maintenance support: site level and depot level. The contractor will also provide technical assistance services and engineering support services.

a. **Site Level Maintenance.** Initially, the contractor will provide the necessary resources, including site spare LRU's for site level maintenance support. Site level maintenance will include corrective maintenance and preventive maintenance (PM) tasks. This support will continue through the initial 7-month reliability demonstration period and one subsequent year. Site maintenance responsibilities will be assumed by regional sector personnel within 2 years after site acceptance.

Once configuration control is established, the equipment baselined, the appropriate personnel trained and the staffing and supply support evaluated, the FAA will assume full responsibility for the site-level maintenance of the ICSS Phase 1B equipment including the ownership of all site spare LRU's.

b. **Depot Level Maintenance.** The contractor will provide depot-level maintenance for the ICSS Phase 1B for 10 years based on 10 one-year options. The contractor will furnish all qualified labor, supervision, materials, equipment, tools, appliances and services to repair ICSS Phase 1B LRU's and revise ICSS Phase 1B software and firmware. Depot-level maintenance will be performed at the contractor's facility. The work will consist of the following:

(1) **Emergency Replacement.** Emergency replacement will require the shipment of serviceable components to specified FAA sites within 24-hours after receiving a request from the FAA Logistics Center. The 24-hour time requirement includes holidays and weekends.

(2) **Routine Repair.** Routine repair will be completed within 30 calendar days after the contractor receives a failed LRU from the FAA. LRU's will be restored to a serviceable operating condition suitable for their intended use.

c. **Technical Assistance.** The contractor will provide FAA personnel with technical assistance for the maintenance of ICSS Phase 1B hardware and software. This technical assistance will be through ASM-600 and will consist of the following:

- (1) "Hot-line" telephone advisory service.
- (2) Onsite technical assistance.
- (3) Engineering support services.

91. **TRAINING.** The contractor will develop all training programs and training material for the FAA field sites, FAA Academy, FAA Logistics Center, and contractor facilities in accordance with FAA-STD-028a, Contract Training Programs.

a. **AT.** ICSS Phase 1B training will provide the skills to operate the elements and subsystems of the ICSS Phase 1B. Training will be conducted at the facility at which the ICSS Phase 1B is being installed using the contractor's equipment or at a contractor facility using contractor installed equipment. Five to ten students should attend each class. Organizations concerned with AT training include:

(1) ATZ-100 - will develop an AT training proposal and forward the proposal to AHT-500.

(2) AHT-500 - will be responsible for developing action plans based on ATZ-100's training proposal.

(3) AAC-900 - will assume responsibility for reviewing the training plans and requirements and overseeing the contractor's conduct of AT training.

b. **AF.** Hardware maintenance training classes will be conducted at the FAA Academy or at the contractor's facility. A minimum of six (6) students to a maximum of twelve (12) students will attend each class. Software maintenance training classes will be conducted at the contractor's facilities with a minimum of three (3) and a maximum of twelve (12) students attending each class. Organizations concerned with AF training include:

(1) ASM-260 - will develop an AF training proposal and forward this proposal to AHT-400.

(2) AHT-400 - will be responsible for developing action plans based on ASM-260 training proposal.

(3) AAC-900 - will assume responsibility for reviewing the training plans and requirements and overseeing the contractor's conduct of the AF training.

c. Depot-Level Maintenance Training. If needed, the contractor will provide depot-level maintenance training for the FAA Logistics Center technicians and engineers. Training will be provided to FAA personnel at their FAA Logistics Center work station, or at the contractor's facility.

92. SUPPORT TOOLS AND TEST EQUIPMENT. The contractor will identify all required support tools and test equipment, including common, special, and the FAA Logistics Center special equipment required to perform operational and maintenance tasks at all levels. This information will be provided to ANC-200, ASM-600, and the Technical Standards Program, ASM-120.

93. SUPPLY SUPPORT. Supply support includes spare parts and consumables to support maintenance actions. The contractor, when responsible for site-level maintenance, will take the necessary actions to replace used site spares.

94. VENDOR DATA AND TECHNICAL MANUALS. The contractor will provide all technical data and manuals to each site in accordance with the ICSS Phase 1B specification. The manuals provide information on the use and maintenance of the ICSS Phase 1B. The contractor will provide camera-ready copies of all technical manuals to ASM-600 for updating and maintaining these documents in accordance with the configuration baseline. These manuals include instruction books and operators manuals.

95. EQUIPMENT REMOVAL. Government owned equipment removed by the FAA during installation of the ICSS Phase 1B will be disposed of by each region in accordance with Order 4800.2A, Utilization and Disposal of Excess and Surplus Personnel Property. Regions will also be responsible for arranging for the removal of leased voice switching equipment.

96. FACILITIES. The ICSS Phase 1B will be configured to fit within existing facilities. No special responsibilities have been assigned to the FAA for designing, developing, or acquiring support facilities. The FAA will accomplish site preparations for support of the installation effort at each site.

97.-99. RESERVED.



CHAPTER 10. ADDITIONAL PROJECT IMPLEMENTATION ASPECTS

100. **CONFIGURATION MANAGEMENT**. The configuration management process is used to identify and document the functional and physical characteristics of a configuration item, control changes to those characteristics and record and report change processing and implementation status. The configuration management discipline will be applied to all configuration items included in the ICSS Phase 1B baseline. All additions and changes to the ICSS Phase 1B baseline will be proposed in the form of a case file and will be reviewed for approval or disapproval by a Configuration Control Board (CCB). Changes to the baseline will be controlled by the ANC-1 CCB.

a. **Acquisition Phase Configuration Management**.

(1) **FAA Responsibility**. The ANC-1 CCB controls the establishment of and changes to, the ICSS Phase 1B hardware and software baselines during the acquisition phase. The ANC-1 CCB is responsible for ensuring that the functional, performance, and interface requirements allocated to the ICSS Phase 1B hardware and software subsystems are reflected in the baselines. The ANC-1 CCB retains this configuration management responsibility until the last ORD has been completed. The CCB will include members from:

- (a) ASM.
- (b) ATR.
- (c) ASE.
- (d) ASU.
- (e) ANS.
- (f) SEI.
- (g) ANC.

(2) **Contractor Responsibility**. The contractor will plan, execute, and manage the configuration management functions associated with the development of ICSS Phase 1B hardware and software enhancements during contract performance, in accordance with the ICSS Phase 1B specification. The contractor will also conduct the required configuration audits with the following FAA participants:

- (a) ANC-200.
- (b) ASM-100.
- (c) ASE-600.
- (d) AAC-400.

b. **Transition of Hardware/Software Configuration Management.** The configuration management responsibility associated with the ICSS Phase 1B hardware and software products will transition from ANC-200 to ASM-600, after the last ORD has been completed. Approval authority of all ICSS Phase 1B NAS Change Proposal (NCP) activity will transition from the ANC-1 CCB to the ASM-100 CCB. A handoff package for the ICSS Phase 1B will be prepared by ANC-200 consisting of all hardware technical and provisioning documentation, all software magnetic tapes and supporting documentation and site installation documentation.

c. **Operational Support Phase Configuration Management.** During the operational support phase, and for the entire life-cycle of implemented ICSS Phase 1B hardware and software, configuration management functions will consist of maintenance and change control management. The participants and their roles are as follows:

(1) ASM-100 will chair the ASM-100 CCB for all changes to the ICSS Phase 1B hardware and software and authorize all modifications.

(2) ASM-600 will be the recipient organization for system engineering technical documentation for all hardware and software and will act as the custodians of hardware/software documentation and all software magnetic media. ASM-600 is also responsible for reviewing all case files and any contractor generated Engineering Change Proposal (ECP) for proposed modifications to the Phase 1B system.

(3) AAC-400 will be the recipient organization for all provisioning technical documentation for ICSS Phase 1B.

101. **ADDITIONAL POSITION EQUIPMENT.** Site personnel will be responsible for procuring position equipment. Headsets, handsets and microphones may be obtained through the FAA Logistics Center. Headsets with built-in volume control amplifiers exceed the parameters defined in the Occupational Safety and Health Act (OSHA) of 1970 and should not be used with the ICSS Phase 1B equipment. Headsets may be ordered with the following Plantronics, or equivalent, parts numbers:

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Eartip Kit	06448-00
Personal Storage Pouch	13698-01
Voice Tube	17457-02
Eyeglass Frame Adapter	07169-00
User Instruction Guide	17529-00

Eartip kits come in two colors, pink and white. Pink eartips are recommended as they provide about 5 dB higher gain than the white eartips. A background noise suppressor, similar to a Plantronics BNS-1, SSP1045-01, for attachment to the voice tube, may be utilized in facilities with high ambient room noise, and will provide suppression for about 6 dB of room noise resulting in an improved signal to noise ratio.

102.-109. RESERVED.



APPENDIX 1. ACRONYMS

A/G	Air-to-Ground
AF	Airway Facilities
AFSS	Automated Flight Service Station
AGC	Automatic Gain Control
APML	Associate Program Manager for Logistics
ARTCC	Air Route Traffic Control Center
AT	Air Traffic
ATCT	Airport Traffic Control Tower
ATS	Administrative Telephone System
CAI	Contractor Acceptance Inspection
CCB	Configuration Control Board
CIP	Capital Investment Plan
CM	Configuration Management
dB	Decibel
dBm	Decibels referenced to one milliwatt
DECCO	Defense Commercial Communications Office
DRR	Deployment Readiness Review
DT&E	Development Test and Evaluation
DTMF	Dual-Tone Multi-Frequency
ECP	Engineering Change Proposal
E&M	Ear and Mouth
F	Fahrenheit
FAA	Federal Aviation Administration
F&E	Facilities and Equipment
FMF	Facility Master File
G/G	Ground-to-Ground
GSA	General Services Administration
Hz	Hertz
ICD	Interface Control Document
ICSS	Integrated Communications Switching System
ILSP	Integrated Logistics Support Plan
IOC	Initial Operating Capability
IRD	Interface Requirements Documents
ISP	Integrated Support Plan
JAI	Joint Acceptance Inspection
LOA	Letter of Agreement
LRU	Line Replaceable Unit
MS	Milliseconds

MDDF	Material Delivery Data File
N/A	Not Applicable
NAILSMT	National Airspace System Integrated Logistic Support Management Team
NAS	National Airspace System
NCP	NAS Change Proposal
ORD	Operational Readiness Demonstration
OSHA	Occupational Safety and Health Act
OT&E	Operational Test and Evaluation
PABX	Private Automatic Branch Exchange
PAT&E	Production Acceptance Test and Evaluation
PDSR	Program Director Status Review
PIP	Project Implementation Plan
PM	Preventative Maintenance
PPL	Provisioning Parts List
PSTN	Public Switched Telephone Network
QRO	Quality Reliability Officer
RCE	Radio Control Equipment
RMMS	Remote Maintenance Monitoring System
RPMS	Regional Project Management System
SDR	System Design Review
SEI	Systems Engineering and Integration
SS	Selective Signalling
T	Contract Award Date
TBD	To Be Determined
TCS	Tower Communications System
T&E	Test and Evaluation
TIM	Technical Interchange Meeting
TLP	Transmission Level Point
TO	Technical Officer
TOR	Technical Onsite Representative
TPL	TSARC Project List
TPRB	Test Policy and Planning Review Board
TRACON	Terminal Radar Approach Control Facility
TSARC	Transportation Systems Acquisition Review Council
TSR	Tele-Communications Service Request
TVRTM	Test Verification Requirements Traceability Matrix
UPS	Uninterruptible Power Supply
VFR	Visual Flight Rules
VFSS	Voice Frequency Signalling System
VAC	Volts Alternating Current

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Appendix 1

VSCS
WATS
WECO

Voice Switching and Control System
Wide Area Telephone System
Western Electric Company



APPENDIX 2. APPLICABLE DOCUMENTS

FAA-S-1142a	Voice Frequency Multi-Tone Remote Control Circuits
FAA-E-2162b	Microphone, Hand-held
FAA-E-2170	Switch, Foot-Bar
FAA-E-2312a	Console, TRACON/RAPCON Modular
FAA-E-2603a	Noise canceling Headset and Handset
FAA-G-2100e	Electronic Equipment, General Requirement
Order 1800.63	National Airspace System (NAS) Deployment Readiness Review (DRR) Program
Order 1810.4A	FAA NAS Test and Evaluation Program
Order 4800.2A	Utilization and Disposal of Excess and Surplus Personnel Property
Order 6000.22	Maintenance of Two-Point Private Lines
Order 6030.45	Facility Reference Data File
Order 6480.6B	Maintenance of Terminal Air/Ground Communication Facilities
FAA-P-2854a	ICSS Phase 1B Purchase Description
FAA-STD-019b	Lightning Protection, Grounding, Bonding and Shielding Requirements for Facilities
FAA-STD-020a	Transient Protection, Grounding, Bonding and Shielding Requirements for Equipment
FAA-STD-021a	Configuration Management
FAA-STD-028a	Contract Training Programs

FAA-STD-036	Preparation of Project Implementation Plans
MIL-STD-471A	Maintainability Verification/Demonstration/Evaluation
NAS-IC-42028401	TCS and ICSS to Existing Radio Equipment
NAS-IC-42028403	TCS and ICSS to Existing ICSS Trunks
NAS-IR-42009404	Voice Switch/Private Automatic Branch Exchange
NAS-MD-790	Maintenance Processor Subsystem to Remote Maintenance Subsystem and Remote Monitoring Subsystem Concentrator

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APPENDIX 4. TRANSMISSION PLAN

1. **TRANSMISSION PLAN.** The following subparagraphs describe transmission levels and provide for the proper overall insertion loss consistent with NAS transmission levels. This transmission plan is based upon the existing 0, -16 levels utilized in switching systems currently in use in the NAS.

a. **Transmission Objectives.** The transmission objectives for the ICSS Phase 1B are as follows:

(1) Provide the user of the ICSS Phase 1B with a superior grade of service for all A/G and G/G communications.

(2) Provide the user of the ICSS Phase 1B with quality voice level reception.

b. **Speech Volume.** The average speech volume is the average speech power at the 0 Transmission Level Point (TLP). The average speech power at the 0 TLP for the ICSS Phase 1B is equivalent to a -20 dBm, 1004 Hz tone.

c. **0 TLP** 0 TLP is defined at the transmit microphone on the position headset (measurements may be initiated at the headset jack). The 0 TLP for the ICSS Phase 1B transmission plan does not conflict with the 0 TLP defined in Order 6000.22, Maintenance of Two-Point Private Lines. Use of the private line 0 TLP, in the ICSS Phase 1B transmission plan, is precluded as over 40 different types of communications switches are in use in the NAS and the transmission levels/plans for many of the systems are propriety and/or not available.

d. **Loss.** To ensure a quality grade-of-service for ICSS 1B systems, the transmission losses for inter ICSS 1B connections and the losses from ICSS 1B to other NAS systems must be controlled. The ICSS 1B transmission levels are designed to provide sufficient headroom to avoid peak clipping of audio signals on N or T carrier systems and to provide a sufficient signal to noise ratio. The nominal input voice signal, at the transmit microphone of a Plantronix 0311-XX headset, or equivalent, is defined as 18.6 vu. This equates to a nominal voice power level of - 20 dBm (dBm = vu - 1.4). Since the overall transmission plan defines a 0 dB transmit, - 16 dB receive, the input of a -20 dBm nominal voice signal into a headset will result in the receipt of a - 36 dBm audio signal at the receiving headset.

The volume control will provide for adjustment of this signal to - 27 dBm and - 46 dBm. These levels comply with an OSHA receive level protection requirement of 91 dBspl(-27 dBm) for a 7-hour listening period. The ideal signal to noise ratio is 29 dB with a minimum of 21 dB. The noise requirement for ICSS 1B is 20 dBmC. A typical circuit provided by a common carrier, with a 40 dBmCO noise requirement, engineered for 16 dB loss, will result in the receipt of a 24 dBmC noise signal. When combined with the ICSS 1B noise signal this results in a total noise signal less than 26 dBmC, which provides a 26.5 dB signal to noise ratio with a - 36 dBm nominal receive level. Another potential source of noise input is controller room noise. Excessively high room noise levels can be a major cause of controllers having difficulty hearing other controllers or pilots. Accordingly, the following ambient room noise limits should be observed near the heads of the controllers;

Maximum average room noise level	52 dB (A)
Peak room noise level	59 dB (A)

These levels are referenced to 20 uPA with A-weighting, measured with the noise meter adjusted for slow response.

e. Connecting Networks and Systems. The ICSS Phase 1B will interface with various FAA networks and systems including existing ICSS trunks, the Voice Switching Control System (VSCS), Western Electric Company (WECO) 300 equipment, PABX equipment and existing radio equipment. Subparagraphs 1e(1) through (3) detail the recommended transmission levels for these networks and systems.

(1) ICSS Phase 1B to ICSS, VSCS or WECO.

(a) All ICSS Phase 1B to ICSS, VSCS or WECO connections will use four wire trunks with transmission levels as indicated in figure 1. This range of adjustment will allow the ICSS Phase 1B to interface to all standard analog or digital transmission facilities. The level received at the ICSS Phase 1B facility demarcation point should be 15.5 dB below the power level of the test tone from the ICSS, VSCS or WECO systems.

(b) All ICSS Phase 1B-to-ICSS Phase 1B connections use four-wire trunks with transmission level adjustments as indicated in figure 1. The range of adjustment allows interfacing to all standard analog or digital transmission facilities. Many of the trunks currently in use in the NAS use a 0 dB transmit, -16 dB receive from facility demarcation point to facility demarcation point. Trunks implemented since 1984 often use a 0 dB transmit to - 4 dB receive between the same demarcation points.

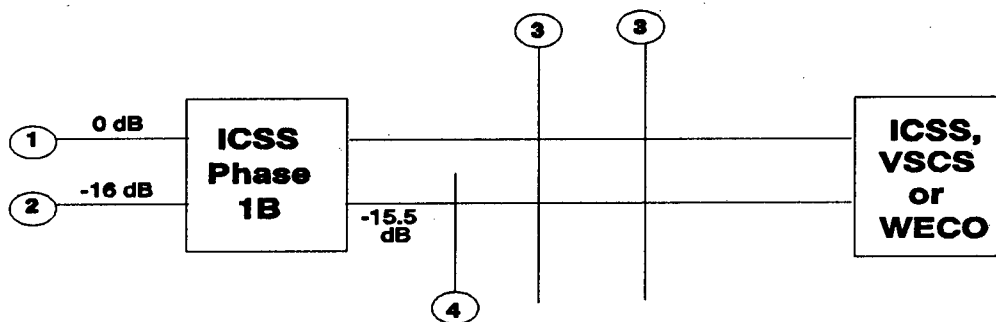
The NAS is progressing to total digital transmission with a 0 dB transmit to a 0 dB receive between facility demarcation points. Since the transmission objective is a 0 dB input to the headset microphone to -16 dB receive at the headset receiver pads and/or amplifiers are often required to achieve this goal and to provide for uniform transmission levels. On ICSS Phase 1B to ICSS Phase 1B connections the loss may be established/verified by the input of a 10 dBm, 1004 Hz test tone, at 50 ohms, into the transmit headset jack. The level received at the receiving facility demarcation point should be -26.5 dBm (15.5 dB below the O TLP) (See note 4, figure 1).

(c) ICSS 1B to VSCS interfaces will be four-wire trunks. The adjustment criteria will be identical to that utilized for ICSS Phase 1B to ICSS Phase 1B connections as specified above, and reflected in figure 1. The transmission objective may be verified by application of a test tone on the transmit side of the headset microphone jack. The level received at the ICSS Phase 1B facility demarcation point should be 15.5 dB below the power level of the test tone from the VSCS or WECO 300. The WECO 300 is generally engineered for an 8 to 9 dB loss between the headset jack and the WECO 300 demarcation point. Accordingly, insertion of a test tone at the VSCS or WECO 300 headset jack to verify the receive levels is recommended.

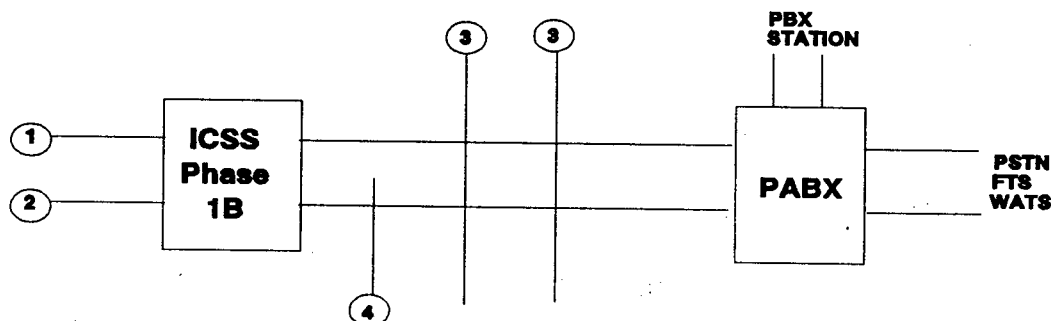
(2) ICSS Phase 1B to PABX. All ICSS Phase 1B to PABX interfaces will use four-wire trunks as indicated in figure 2. This interface will use E&M signalling and will allow the ICSS Phase 1B to connect to the PSTN, FTS, and WATS network through the PABX. The loss between the ICSS Phase 1B and the PABX should be 0 dB.

(3) ICSS Phase 1B to Existing Radio Equipment. ICSS Phase 1B to existing radio equipment will use four wire trunks with transmission levels as indicated in figure 3. All transmission requirements apply to local and remote radio interfaces. Local and remote radio transmitters may be equipped with transmitter Automatic Gain Control (AGC) cards to preclude overmodulation. ICSS Phase 1B to existing radio equipment will be over FAA provided local lines. The loss between the ICSS Phase 1B and the existing radio equipment should be 16 dB. The transmission plan defines a 0 dB transmit, -16 dB receive at the interface to the radio transmitter and at the receive interface to the radio interface card for the ICSS Phase 1B. Pads and amplifiers may be required to ensure the integrity of this loss plan. If transmission lines are in conformance with FAA-S-1142a, Voice Frequency Multi-Tone Remote Control Circuits, the specified line loss will be 9 dB. Accordingly, -9 dB will be the loss to the ICSS Phase 1B. Current FAA radio alignment procedures will compensate for the difference between the 16 dB loss specified for ICSS Phase 1B and the 9 dB loss provided under the provisions of FAA-S-1142a and the net effect will be a 17 dB loss from the radio equipment although the transmission plan only indicates 9 dB.

FIGURE 1. ICSS PHASE 1B TO ICSS, VSCS OR WECO TRANSMISSION LEVELS



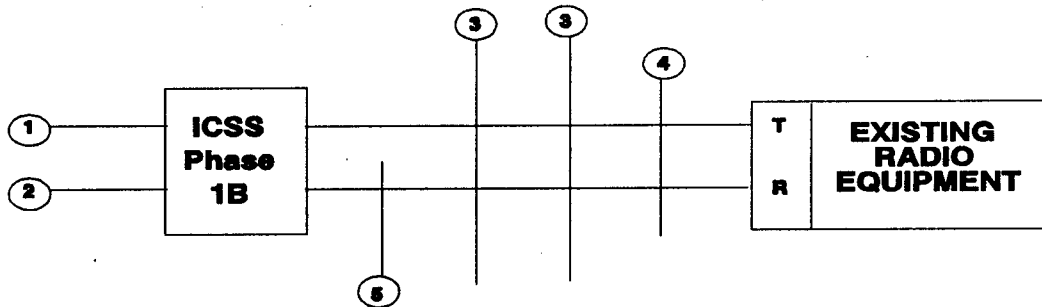
- (1) Transmit headset jack = 0 TLP; equivalent to -20 dBm nominal transmit level.
- (2) Receive headset jack = -16 TLP; equivalent to -36 dBm nominal receive level.
- (3) Facility or local demarcation point.
- (4) ICSS Phase 1B interface module(s). Receive signal level at this point must be -15.5 dB.

FIGURE 2. ICSS PHASE 1B TO PABX TRANSMISSION LEVELS

- (1) Transmit headset jack = 0 TLP; equivalent to -20 dBm nominal voice input level.
- (2) Receive headset jack = 0 TLP; equivalent to -20 dBm nominal receive level.
- (3) Facility or local demarcation point.
- (4) ICSS Phase 1B interface module(s). Receive signal level at this point must be 0 dB.

Note: Input of a signal at point 1 should result in the receipt of a signal .5 dB +/- .4 dB lower at point 3 for the PABX.

FIGURE 3. ICSS PHASE 1B TO EXISTING RADIO EQUIPMENT TRANSMISSION LEVELS



- (1) Transmit headset jack = 0 TLP; equivalent to -20 dBm transmit level.
- (2) Receive headset jack = -16 TLP; equivalent to -36 dBm receive level.
- (3) Facility or local demarcation point.
- (4) Local or remote interface to radio transmitters and receivers.
- (5) ICSS Phase 1B interface module(s).

Note: Input of a signal at point 1 should result in the receipt of a signal 16 dB lower at point 4 for Existing Radio equipment. The signal level received at point 5 should be 16 dB lower than the input signal level. See text for information on lines conforming to FAA-S-1142a.